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**on its eighth session**
**(22 to 30 April 1991)**

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## NOTE

Symbols of United Nations documents are composed of capital letters combined with figures. Mention of such a symbol indicates a reference to a United Nations document.

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For the recommendations, resolutions, declarations and decisions adopted by the United Nations Conference on Trade and Development, see:

First session—*Proceedings of the United Nations Conference on Trade and Development*, vol. I, *Final Act and Report* (United Nations publication, Sales No. 64.II.B.11), pp. 18-65;

Second session—*Proceedings of the United Nations Conference on Trade and Development, Second Session*, vol. I and Corr.1 and 3 and Add.1 and 2, *Report and Annexes* (United Nations publication, Sales No. E.68.II.D.14), annex I, A, pp. 28-58;

Third session—*Proceedings of the United Nations Conference on Trade and Development, Third Session*, vol. I, *Report and Annexes* (United Nations publication, Sales No. E.73.II.D.4), annex I, A, pp. 53-114;

Fourth session—*Proceedings of the United Nations Conference on Trade and Development, Fourth Session*, vol. I and Corr.1, *Report and Annexes* (United Nations publication, Sales No. E.76.II.D.10), part one, sect. A, pp. 6-43;

Fifth session—*Proceedings of the United Nations Conference on Trade and Development, Fifth Session*, vol. I, *Report and Annexes* (United Nations publication, Sales No. E.79.II.D.14), part one, sect. A, pp. 6-50;

Sixth session—*Proceedings of the United Nations Conference on Trade and Development, Sixth Session*, vol. I, *Report and Annexes* (United Nations publication, Sales No. E.83.II.D.6), part one, sect. A, pp. 6-40;

Seventh session—*Final Act of UNCTAD VII*, adopted by the United Nations Conference on Trade and Development at its seventh session (TD/350 and Corr.1).

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## INTRODUCTION

1. In accordance with the calendar of meetings approved by the Trade and Development Board, the Committee on Transfer of Technology held its eighth session at the Palais des Nations, Geneva, from 22 to 30 April 1991. In the course of its session, the Committee held six plenary meetings (81st to 86th plenary meetings).

### Opening statements

2. On taking the Chair, the Chairman called on delegations to seek common denominators in their discussions, putting responsibility for international coexistence above the diverse interests, problems and concerns of States.

3. The Deputy to the Secretary-General of UNCTAD referred to the rapid economic, political and technological changes of recent years which, coupled with a levelling off of technology and financial flows to the developing countries of Africa and Latin America in particular, could have wide-ranging consequences for their rate of technological transformation. Although, in the short term, the plans of the European Economic Community for a single market in 1992 and integration processes in Eastern Europe might divert some investments, the long-term effect of these changes could be the creation of new trading opportunities for developing countries. This was the international context in which countries would have to promote their technological development by liberating and reinforcing the dynamism of the productive sector. The concurrent informal consultations on the draft international code of conduct on the transfer of technology would need to give special consideration to important policy shifts with regard to foreign investment and technology transfer as well as to new practices in the transfer of technologies and methods of its protection. Sustainable development and improved access to information on the impact of technological development would also require international cooperation for a coherent policy of environmental protection. He also stressed the important role of the Advisory Service on Transfer of Technology which emphasized human resources development in promoting acquisition, transfer, mastery and development of technology, particularly in the least developed among the developing countries. Finally, he invited the Committee when setting the orientation of future work to reflect on the contribution which it could make to the success of UNCTAD VIII, where technology figured prominently on the agenda.

## Chapter I

### GENERAL STATEMENTS

4. The representative of Egypt referred to the declining flows of technology to most developing countries, in particular those in Africa, and to the reduction of investment in technology in those countries, resulting from external economic problems and the advent of new and emerging technologies. He proposed that the UNCTAD secretariat carry out an in-depth study of the effects of new economic groupings among developed countries, economic changes in Eastern Europe and the outcome of the Uruguay Round on the flow rate of technology transfer and investments to developing countries. Like many developing countries, Egypt had adopted more liberal policies, laws and measures towards foreign investment and transfer of technology but, unfortunately, the external response had been limited. The developed countries would need to give their enterprises incentives to increase such flows to developing countries. Similarly, for international measures in the area of technology transfer to be effective, they had to be accompanied by alleviation of the debt burden on the developing countries and by the opening up of markets in developed countries to exports from developing countries. Access to private- and government-financed research and development (R & D) programmes in the developed countries was of paramount importance to developing countries. The impact of biotechnology on many economic sectors, especially agriculture, pharmaceuticals and chemicals, had particular relevance for developing economies, including Egypt.

5. He drew attention to the specific situation of least developed and African countries which lacked basic technological infrastructure and needed human resources development and institution-building. Donor countries and international institutions should provide assistance to South-South technical cooperation facilities. On the subject of reverse transfer of technology (RTT), he urged the Committee to take a decision to convene the Governmental Experts on Reverse Transfer of Technology. Support should be given to the relevant programmes of Transfer of Knowledge Through Expatriate Nationals (TOKTEN-UNDP) and the International Organization for Migration (IOM). As far as the relationship between environment and technology was concerned, he emphasized the responsibility of the developed countries to provide environmentally sound technologies to developing countries on concessional and non-commercial terms and to help them develop those technologies domestically.

6. He highlighted the importance of an international code of conduct on the transfer of technology and of revising the Paris Convention for the Protection of Industrial Property. Referring to the Uruguay Round of multilateral trade negotiations, he said that it was important that agreements on TRIPS, TRIMs and services should take into account the technological and developmental objectives of the countries involved and that these countries be given the necessary flexibility in the application of those agreements. Finally, he praised the role of the Advisory Service on Transfer of Technology in providing excellent technical assistance in response to the specific requests and requirements of developing countries, and he recommended that these activities be continued and strengthened, particularly with a view to helping the developing countries to acquire new and emerging technologies and to adapt them to their development requirements.

7. The representative of Sri Lanka said that, owing to the profound changes taking place, the world had become more interdependent, not only with respect to markets, but also regarding technology and its promotion. It was thus imperative to seek a global approach, so that all countries could participate in the development process by sharing technological know-how. New perceptions on global competitiveness required dynamic interaction between entrepreneurs, innovators and users of technology. The revolutionary transformation in materials, science and engineering and the consequent spawning of new advanced materials was of fundamental importance to the world economy. Diffusion of information technology and biotechnology would have far-reaching effects on developing countries' trade prospects. Heightened concerns to protect technology had been considerably influenced by changes in the competitive structure of international trade. The international debate in this regard should ensure that such protection would not be detrimental to the development of national technological capacity on the part of developing countries or affect their access to technology or impinge on trade relations. For the promotion of transfer of technology to developing countries, an important role was played by the prevailing financial environment, information on available technologies and ways of acquiring them. It was thus essential to identify possible arrangements and supportive actions designed to facilitate wider utilization of technologies in the public domain, along with R & D results emanating from publicly-funded projects. In addition, there was an urgent need to reorient R & D systems, so that they could promote the effective transfer of know-how to local enterprises and assist in the adaptation of imported technologies. Strengthening the capacity of developing countries to identify their technological needs and areas where they would have a potential advantage in international markets was vital. In this regard, the assistance of international agencies was required. The global spread of new technologies offered wide scope for international cooperation.

8. The representative of the World Association of Former United Nations Interns and Fellows (WAFUNIF) recalled the importance of the problem of reverse transfer of technology (RTT), as reflected in Committee resolutions 7 (II) and 13 (III), and in General Assembly resolution 43/184 of 20 December 1988; likewise, the subject had been treated by the South Commission in its 1990 report, as well as by the International Organization for Migration (IOM). The timeliness of the issue was undeniable, since it was a corollary to the financial decapitalization of developing countries as a result of their debt burden, and to the reduction of social and educational investment following the application of structural adjustment policies. The trend was exacerbated by new migration policies implemented by several developed countries. These policies favoured scientific and technical personnel, and both governments and transnational corporations aimed to attract such university graduates from developing countries. WAFUNIF also recognized the importance attached to RTT in the signing of the Lomé IV Convention between the African, Caribbean and Pacific (ACP) countries and the European Economic Community (EEC), introducing practical measures to counter the effects of this phenomenon. Thus, WAFUNIF wished to propose the following suggestions: firstly, the Committee's final resolution should accord due importance to RTT as a determinant in the process of transferring technologies; secondly, the Governmental Experts on Reverse Transfer of Technology should be re-activated in the near future to deal with this question; finally, the UNCTAD secretariat should endeavour to formulate

a global action programme integrating practical measures to halt the RTT phenomenon, in cooperation with developing and developed countries as well as with competent international organizations. This could be included in the agenda of UNCTAD VIII.

9. The representative of India pointed to the crucial role of technology in meeting development objectives, since technology had become the centrepiece for achieving development in developing countries. However, technological developments required large investments, a condition which many developing countries were unable to meet, given their more pressing problems of mere survival. The problems had been compounded by difficult access to markets, to know-how and to technology. This was the result not only of market imperfections but also of governmental protectionist policies in the supplier countries.

10. The implications of biotechnology for agriculture, animal husbandry and human health had been recognized in India with the establishment of new institutes and international cooperation on research and development. India's experience with technology acquisition, absorption and the building up of overall endogenous technological capabilities had included the promotion of consultancy services and support to the development of the small-scale sector, which was so important for industrial production as well as for exports of manufactured goods. A biotechnology consortium had recently been established linking the Government, leading financial institutions and potential users. India had also embarked on preparation of status reports on technology that was critically needed in the country; this had resulted in high quality technological information readily available to assist in the further acquisition of technology. India would be happy to share its experience in this field.

11. The adoption of the proposed international draft code of conduct on transfer of technology remained relevant despite the lapse of time since work had first begun on it. As the draft sought to strike a fair balance between the needs of technology suppliers and recipients, it was all the more important that the occasion of UNCTAD VIII be used for its finalization. Environmental issues should be addressed in the code, paying particular attention to sustainable development, so that technological hazards were not transferred from one part of the globe to another. Negotiations on the code should continue and clear-cut recommendations should be made.

12. The representative of the World Assembly of Small and Medium Enterprises (WASME) commended the documentation which the UNCTAD secretariat had prepared. As small and medium-sized enterprises in the developing countries were the ones most likely to be affected by the stagnation of technology flows or continued financial constraints, WASME endorsed those conclusions of the report (TD/B/C.6/153) which were of interest to small and medium-sized enterprises, inter alia, those contained in paragraph 85, and the proposal set out in paragraph 84. In paragraph 8 of TD/B/C.6/155/Add.1, reference had been made to an interregional project proposal on the role of small and medium-sized enterprises in the transfer of technology to developing countries. WASME was prepared to cooperate with UNCTAD in the execution of this project, as had been requested, and appealed to the Governments represented in the Committee for their financial support of the project.

## Chapter II

## TRANSFER AND DEVELOPMENT OF TECHNOLOGY IN A CHANGING WORLD ENVIRONMENT: THE CHALLENGES OF THE 1990s

(agenda item 3)

13. For its consideration of this agenda item, the Committee had before it a report by the UNCTAD secretariat entitled "Transfer and development of technology in a changing world environment: the challenge of the 1990s" (TD/B/C.6/153).

14. The Officer-in-Charge of the Technology Programme highlighted the main factors influencing technological progress in developing countries. Technology flows to most of these countries had improved only modestly in the second part of the 1980s. In contrast, such flows had expanded among developed market-economy countries and had accelerated for a few developing countries in Asia. The effect of technological advances on the demand for raw materials had been such as to cast doubt on expectations of growth like that of the 1960s or 1970s in such exports from developing countries, although the impact would depend on their own industry's relative capacities to acquire and use new technology. Reinforced protection of intellectual property rights and strategic alliances among companies in developed market-economy countries would tend to raise the cost of access to technology in certain fields: pharmaceuticals, chemicals and semi-conductors. For most other industries, prices would remain competitive. Other changes under way - adoption of a liberalized trading system and broadening of the EEC - would affect trade internationally. Along with stricter protection of technological innovation, restrictions on the use of investment measures and the liberalization of world trade in services could also adversely affect technological progress in developing countries if their special position were not given sufficient weight in international agreements. Environmental concerns had implications for sustainable development for both developing and developed countries alike. The second part of the report was devoted to the recent experience of some developing countries in building up technological dynamism through efficient industrialization. The analysis of their policies suggested that the incentive structure in product markets and intervention in factor markets had formed an integral part of the policy package of successful export-oriented countries. The secret of success apparently lay in finding a balance between incentives, on the one hand, and adequate capabilities and institutions, on the other, supported by selective policy interventions. On an international level, there was a need to explore further new initiatives for technological cooperation.

15. The spokesman for the Group of 77 (Mexico) said that the dramatic transformative capacity that technology had acquired in relation to every aspect of economic and social life in the world had become one of the most striking features of contemporary international life. As never before, technology held the potential to improve the human condition as a whole. The universal character of technological knowledge meant that all peoples had the right to benefit from the advancement in science and technology. The distribution pattern of technological diffusion had, however, proved unfavourable to the developing countries, with the result that the technology gap between developed and developing countries had widened further in the 1980s. Several complex, often interrelated factors, including financial

constraints had forced the developing countries to reduce drastically both imports of, and investments in, technology. This had affected their capacity to regenerate their capital stock, and also their participation in international technological cooperation. Regarding investments in new, emerging technologies, the developing countries might find themselves marginalized from such critical areas as biotechnology, new materials technology and micro-electronics. The question of access to these new technologies and related assets, supported by the establishment of favourable skill profiles and cooperation modalities, had become urgent. Furthermore, the implications of current technological changes for competitiveness made it difficult for developing countries to participate in international trade and its related benefits.

16. Regarding structural adjustment at both the global and national levels, the unavailability of technological resources had handicapped developing countries in their structural adjustment and development process. Moreover, structural adjustment policies designed by international financial institutions had often affected the very resources available for social development purposes, such as education, which was fundamental to creating endogenous technological capacity and skill formation. Also lacking was the infrastructure for achieving technological dynamism. The technology market, as a seller's market, offered only limited scope for acquisition, diffusion and upgrading of technology by developing countries. Their access to the state-of-the-art and critical technology was thus rendered difficult, particularly regarding the new and emerging technologies so crucial for trade and development. Developed countries were implementing policies to safeguard and increase their dominant position on technology in the world market, including measures to protect intellectual property.

17. In addition, an impasse had been reached in negotiations on important international instruments, such as the draft international code of conduct for the transfer of technology and the revision of the Paris Convention on Industrial Property. Nevertheless, many developing countries had formulated policies and measures favouring the transfer and development of technology in accordance with their socio-economic objectives. These measures needed to be supported by adequate international cooperation. This could include the elaboration of policies more compatible with the goal of trade expansion for the benefit of all trading partners, particularly developing countries. In an interdependent world, trade could not expand unless the technological capacity of developing countries was strengthened and their technology import capacity restored. External financial constraints, however, had outweighed the legislation adopted by developing countries to attract foreign investment and technology. On both national and international levels, it was essential to examine the different policy options which could allow developing countries to benefit from technological change. It was therefore important that the Committee analyse the external factors influencing such policy options and the prospects for economic growth and the transfer and development of technology in the developing countries. While these countries had intensified their efforts to attract foreign direct investment and transfer of technology, it was clear that concomittant steps by the international community would also be needed to alleviate the effects of debt and to overcome the absence of external private lending and the persistence of weak commodity prices.

Developed countries' attempts to strengthen intellectual property protection through national policies or legislation as well as through international measures to secure uniformly stronger protection worldwide would have serious implications for the development, diffusion and accessibility of technology. Therefore, there was an urgent need for an international framework of principles and standards for technology transfer on fair and equitable terms for both the suppliers and recipients. This was also the rationale underlying an international code of conduct on the transfer of technology.

18. The Group of 77 believed that the application of environmentally sound technologies could contribute significantly to raising the productivity and sustainability of resources in such areas as agricultural production, renewable sources of energy and pollution control, as document TD/B/C.6/153 had pointed out. It would be necessary, however, to accelerate the transfer and development of sustainable technologies to the developing countries. Likewise, consideration would have to be given to broadening the skill and knowledge base on which the developing countries could make environmentally sound decisions on technology imports, consistent with their development priorities, as well as to assisting developing countries in generating such technologies and to channel additional financial resources on concessional terms for such purposes. National policies interacting with global economic forces would continue to influence the pace of industrialization, technological development and economic performance in the years to come. The degree of success with which industrialization had been carried out by different developing countries varied widely. The analysis in the above-mentioned document would suggest that the secret of success in achieving "technological dynamism" lay in combining incentives with adequate capabilities and institutions, each supported by a proper mix of selective and functional interventions by Governments. A positive external environment for acquisition and transfer of technology was also essential. In this respect, the strengthening of the technology-related institutional and human-resource base of the developing countries was vital to their efforts to seize the opportunities offered by technological change and the new and emerging technologies.

19. The Group of 77 endorsed the suggestions set out in the secretariat report, regarding the creation of a supportive international economic policy environment for promoting technology transfer and technological dynamism in developing countries. Among measures to mitigate the adverse consequences of the reverse transfer of technology, priority should be given to ways and means of encouraging skilled personnel from developing countries to remain in their own countries or to return. By enhancing the role of regional and international financial institutions in supporting the transfer and development of technology in developing countries, the capacity of these countries to import technology would be strengthened. To this end, the role of entrepreneurship should not be ignored. In many developing countries, the new policy trend aimed at promoting further collaboration with foreign firms could offer new opportunities for international cooperation in R & D and innovation programmes in specific sectors. Another channel would be to promote systematically, at both the governmental and the enterprise level, the sharing of experience and knowledge among countries with diverse degrees of success in attracting technology inflows and in the absorption, utilization and mastering of foreign technology. Special attention should also be given

to identifying the modalities of new forms of cooperation between developing countries and economic groupings such as EEC. Economic and technological cooperation among developing countries was now more important than ever, including inter-enterprise cooperation. Schemes in this domain could include foreign direct investment, joint R & D, and scientific and technical cooperation with other economic groupings.

20. The representative of China, referring to document TD/B/C.6/153, noted that the international flow of technology was vital for the world economy as well as for the economic development of the developing countries. The technological flow from the developed countries to most developing countries, especially those in Africa and Latin America, had stagnated and declined in real terms. The monumental economic and political changes in the international scene in recent years might have had effects on the international flow of technology. The increase in such protective measures as anti-dumping rules and tariff barriers might have encouraged some companies to increase direct investment in certain countries while refraining from investing in and transferring technology to the developing countries. Recession, the debt crisis, the sharp fall in commodity prices, and the weakened import capacities of developing countries were some of the other factors. During the 1990s, competition among corporations and trading groups would probably intensify further. The suppliers of technology would thus gain stronger bargaining leverage, putting the developing countries in an even less competitive position. Changes in the world situation, entailing regional integration, should not affect the transfer of technology to the developing countries. Many developing countries had taken measures to liberalize their policies and legislation on foreign trade, foreign capital and transfer of technology, in order to increase technological inflows. More important at present, however, was the creation of a congenial international environment favouring the transfer of technology from developed to developing countries.

21. As a result of the rapid progress in science and technology and the advent of new-tech and high-tech products, the protection of intellectual property should be on the agenda. However, in view of the differences that existed in the industrial, scientific and technological levels, as well as in the time required for adopting the relevant legislation in different countries, it might not be appropriate to impose uniform intellectual protection legislation in all countries. The Uruguay Round of multilateral trade negotiations (MTN), in dealing with protection for intellectual property, should therefore take into account the special situation and needs of developing countries. The Government of China attached great importance to the protection of intellectual property rights. Through legislative and administrative measures it provided protection to Chinese and foreign owners of intellectual properties. Since 1985, China had promulgated Regulations and detailed Rules on the Administration of Technology Import Contracts. Moreover, a Copyright Law had been adopted in 1990, for entry into force in June 1991, to protect computer software. In view of the complex nature of the protection of computer software, the competent authorities in China were working on specialized regulations for this purpose.

22. Regarding China's experience in the import and export of technology, from 1979 to 1990 the value of imported technology had amounted to more than $US 24 billion, thus playing an important part in the development of the

national economy, technical renovation of enterprises and scientific development. The principle of equality and mutual benefit was emphasized. Advanced and appropriate technologies were systematically introduced. Importing technologies through joint-venture arrangements had played a major role: from 1979 to 1990, over 29,000 foreign investment enterprises had been approved. The total agreed investment amounted to $US 43.3 billion, with $US 18.9 billion actually paid up. Some progress had been made in the export of China's technologies although work in this area had only begun. The priority area of China's export in this field was in industrialized technologies, with the developing countries as the principal target recipients. China's purpose in exporting technologies was to enhance its participation in world economic and technological cooperation, especially technological exchange and cooperation among developing countries.

23. The representative of Czechoslovakia observed that, since the seventh session of the Committee on Transfer of Technology, many major political and economic changes had occurred in a number of countries of Central and Eastern Europe, including Czechoslovakia. The transformation of his country's economy from a rigid, centrally planned system to a market economy had a direct bearing on its policy for research and development, as well as on that for international transfer of technology. In the last 15 months, a number of laws had been adopted, some directly affecting international technology transfer. These included a set of laws on foreign capital participation, joint-ventures, and on the export and import of goods and technologies and their control, in addition to patents and designs. He pointed out that the transformation of the economy would bring about substantial changes in the structure of research and development, including its external orientation. The existing agreements covering research and development with CMEA countries were under review. Intergovernmental agreements with the market-economy countries on science and technology were being renegotiated and new agreements were being sought. Negotiations were also under way for closer participation by Czechoslovakia in the work of multilateral organizations. Technical cooperation with developing countries, primarily in the form of technical assistance, would continue because stronger economies in the countries of Central and Eastern Europe, despite fears to the contrary, should have a positive influence on such cooperation. Finally, he considered that the secretariat report (TD/B/C.6/153) and the other documents were useful, and that the secretariat should continue its work on the analysis of general trends in the area of technology transfer.

24. The representative of the USSR said that positive changes in the international scene had created new possibilities for technological cooperation and for the creation of a system of technological exchange not affected by military or ideological considerations. He envisaged an increased role in this process for the United Nations, including the UNCTAD Committee on the Transfer of Technology. Radical changes were taking place in his country aimed at the creation of a market system based on new economic and legislative principles more compatible with international norms and rules. Perestroika included, in particular, the introduction of new commercial mechanisms to stimulate innovations and establish an internal market for intellectual property, as well as encouragement of entrepreneurial activity in the field of technological development and foreign investment. The economic reforms would contribute to the expansion of technological cooperation between the USSR, its

republics and regions vis-à-vis other countries, including cooperation in the field of transfer of technology to developing countries. UNCTAD's activities in the field of research work and monitoring of problems related to the transfer of technology, as well as in the area of technical assistance and advisory services, were worthwhile and should be continued and diversified. He also expressed the hope that the consultations on a code of conduct would result in positive decisions. With reference to Board decision 384 (XXXVII), he believed that the environmental dimension should be introduced in the ongoing work of the Committee.

25. He commended the balanced approach outlined in TD/B/C.6/153. The slowdown in the growth of technology flows to developing countries and the deterioriation of their financial situation were cause for concern. Unevenness in the technology flows to individual developing countries had led to growing differentiation among them. Although the emergence of new technologies could be beneficial for the economic growth of developing countries, there had been a trend towards monopolization of these technology markets which would increase the cost of importing such technologies. The prospects for the technological development of the third world countries would be greatly facilitated by a progressive liberalization of world trade and strengthening of trade relations. A more flexible approach should be taken bearing in mind the level of each individual country's development.

26. The representative of Argentina said that access to many scientific achievements and the acquisition of various types of technology were being made difficult since many countries were witnessing the dwindling of national resources. This was partly because the factors contributing most directly to the creation of wealth had changed: a new factor had emerged - "intellectual creation" - which had set the scene for an astronomic development of various technologies that were pushing down the demand for both labour and commodities. Such technologies were generating greater value added but required huge economic investments in research and development which the private sector, on its own, could not always meet. This was why public funds had to be devoted to it. One such example was the active support which European Governments provided to their enterprises in the informatics sector. A matter of special concern to Argentina was the cumulative worsening of the situation. This deterioration was becoming more and more evident with the continued advances made in the field of so-called "new technologies". It was a matter of high priority to devise mechanisms that would encourage access to, and global distribution of, the "intellectual creation" factor. To that end, it was essential to create an atmosphere of renewal and cooperation - a task that was the responsibility of all States. The developing countries could adopt active measures in coordination with the private sector and public research institutions. The industrialized countries could promote R & D activities in the developing countries through fiscal incentives, the training of scientists and technicians from developing countries in their advanced technology programmes, the provision of financial facilities to developing countries for the development of non-polluting technologies, and so on.

27. The spokeswoman for Group B (Netherlands) observed that the main message emerging from the documentation prepared for the session was that mankind lived in a rapidly changing world. Technology was a key to sustained economic growth and improved quality of life. These factors, along with satisfactory

expansion of employment and an improved environment, were in turn dependent upon the creation and diffusion of technology. Government actions, therefore, should support the creation of conditions favourable to the technological development of firms, as well as the provision of efficient infrastructure and the formation of well-educated people able and willing to adapt to change. Firms played a central role in technological development because they were generally more likely to seek new technology for reasons of competition. A favourable climate was necessary for such technological development within a framework of good macro- and micro-economic policies, efficient infrastructure and coordination of policies over the whole range of issues affecting technology innovation and diffusion. Human resources constituted a crucial link in translating technological progress into economic growth and social well-being. Emphasis on education and training of personnel was thus essential. Both the public and private sector had a shared role to play in education and training. Those firms which attached great importance to continuous training of personnel, viewing training not as a cost but an investment, were generally the most successful. Adequate resources had to be directed to the education and training of a labour force that was amenable to technological change. International cooperation, partnership and joint responsibility were concepts which also merited attention in the field of technology.

28. Group B had noted with particular interest the references made by other groups as well as by the secretariat to sustainable development and, in this context, the need for environmentally sound technologies. This was an area where global interests converged. Group B countries were pledging their full support to efforts under way in competent international bodies, for example the Global Environmental Facility (GEF). As had been stressed by the UNCTAD secretariat (TD/B/C.6/153), both domestic and international factors were decisive in furthering technological development. National policies interacting with global economic forces were likely to be a major determinant in the pace of industrialization, technological development and economic performance in the 1990s, although no single route could be defined. A supportive international environment for technology transfer and technological dynamism in developing countries was based inter alia on getting closer to solving financial and balance-of-payments problems. Hence the successful conclusion of the current multilateral trade negotiations and structural adjustment programmes aimed at a combination of capabilities, market incentives and institutions geared to technological dynamism would be important steps. Possible incentives for technology transfer should also be considered. Regional cooperation to promote linkages between developing countries and their enterprises should also receive due consideration. One overriding conclusion in the secretariat report was that inward-looking policies had not worked very well. While the transfer of technology required attention, the further strengthening of technological capacity should not be neglected either. No country was self-reliant in the field of technology, but virtually all countries were dependent on transfer of technology.

29. The representative of Romania referred to the technological gap between developed and developing countries that had been widening since the 1980s, owing to: (a) the rapid development of state-of-the-art technologies; (b) the important difficulties faced by developing countries with their balance of payments; and (c) the rapid expansion of technological exchanges between

developed countries compared to the modest growth of such exchanges among developing countries. An essential objective of a developing country's efforts to reinforce its technological base should be to achieve an optimal balance between domestic and external sources of technology. The Romanian Government had recently adopted measures to rescue the economy. In order to consolidate and expand national R & D, various institutions had been created which would elaborate, at different levels, appropriate policies in this area. Financing sources for the special research and development budget had been created through a 1 per cent revenue tax which might apply to each economic agent. Finally, in view of the importance of foreign investment to the restructuring of the economy, measures had been taken to ensure a favourable juridical environment for such investments. The new law on foreign investments in Romania adopted on 3 April 1991 permitted foreign capital participation as high as 100 per cent in almost all economic sectors. The law provided guarantees for the repatriation of capital and earnings and protected investors against expropriation, requisition and confiscation. The law also established considerable tax advantages such as exemptions from customs duties and a reduction of income taxes.

30. For the international transfer of technology to be beneficial to the developing countries, the following measures were called for: (a) the increase of developing countries' export revenues through the elimination of external barriers to trade; (b) the reinforcement of the support given by international organizations and developed countries for the financing of technology transfer; (c) the diversification of the sources of technology, bringing in small and medium enterprises; (d) the intensification of cooperation among developing countries in relation to the technologies they had already mastered; and (e) the encouragement of technology transfer to developing countries through such measures as fiscal advantages to suppliers in developed countries.

31. The representative of Tunisia, referring to TD/B/C.6/153, said that the secretariat's analysis attested to the favourable and dynamic economies prevailing in the developed market-economy countries. This was in contrast to the situation in developing countries, which were excluded from this prosperity. The technological gap between developed and developing countries, already wide enough, was likely to be widened still further as a result of current trends. The course of the ongoing technological revolution, encompassing among other things biotechnology, new materials technology and information technologies, would lead to a further technological polarization between developed and developing countries. The developing countries, struggling against their debt burden and an unfavourable economic environment, had embarked on painful policy reforms and structural adjustment programmes in line with the recommendations advocated by international financial institutions. Despite these sacrifices, such measures had not resulted in financial and technological flows to developing countries. Turning to the protection of industrial property rights, he said that, while he did not wish to minimize their role for technology generation and development, current moves in the Uruguay Round as well as through the World Intellectual Property Organization (WIPO) had adverse implications for developing countries to the extent that they would hinder rather than help the diffusion of technology. Economic interdependence among countries meant that concerted solidarity was essential between North and South in the transfer of technology as in other

fields. In addition to calling for preferential treatment for developing countries with regard to industrial property rights, he said that his country would strongly support the recommendations contained in the secretariat's report.

32. The representative of the Netherlands, speaking on behalf of the European Economic Community and its member States, said that the objective of promoting technological dynamism - defined as the synergy arising from the interaction of enterprises, markets and institutions - should guide the work of the Committee. The efficacy of technology transfer, for instance, depended on the development of local capacities for the application, adaptation and innovation of technologies. Training played a determinant role and was justifiably at the centre of development programmes along with technical assistance activities in favour of developing countries. Similarly, progress in building R & D capacity in the developing countries depended on cooperation between research institutes and firms. Where possible researchers from developing countries should benefit from the results of fundamental research carried out in more technologically advanced countries in areas of importance for their development. Cooperation in a South-South context appeared particularly promising. The association of developing countries in technological cooperation between research institutes and enterprises in developed countries should be envisaged and encouraged whenever possible.

33. The new and emerging technologies were characterized by rapid change and increasing costs and it was useful for the secretariat to analyse the challenges their development presented for developing countries. In the case of biotechnology, close cooperation between UNCTAD and other competent international organizations would be necessary. The Community attached great importance to cooperation with developing countries in this field, as could be seen from the number of projects it supported on tropical agriculture. However approximative it might be, quantitative evidence showed that, in recent years, transfer of technology had further progressed, although there was significant divergence among regions in the evolution of technology flows. It was undeniable that acute macro-economic disequilibria would discourage prospective investors, in addition to limiting a country's import capacity. The Community and its member States therefore supported developing countries' adjustment efforts to restore healthy and stable economic growth. Technological dynamism, however, was also influenced by trade policies. In this context, lessons could be learned from the different national experiences. The data collected by the secretariat showed clearly that an outward-looking strategy and the application of market principles were essential to succeed in sustained technological development. Favourable legal frameworks and fiscal legislation were essential for attracting investments and ensuring efficient application of technologies.

34. Appropriate mechanisms for the protection of intellectual property would preserve and stimulate technological dynamism. The definition of these mechanisms within the framework of the multilateral trade negotiations was the most appropriate way to take account of various interests and reconcile the objectives to which all subscribed. The Community had on various occasions disagreed with the secretariat's views on the implications for developing countries of liberalization in the services sector. Nor did the Community share the secretariat's pessimistic view regarding the impact on the transfer

of technology to developing countries of the single European market and the integration of Eastern Europe in the world economy. The choice of technologies was important and should be based on information as complete as possible. In this context, particular attention should be given to technologies and research that contributed to the preservation of the environment. The Community had a very wide variety of instruments for cooperation among its member States and its partners in the developing world, aimed at stimulating technological dynamism. Among them were the provisions of article 85 of the Fourth Lomé Convention regarding cooperation between the Community and the ACP countries; cooperation with countries in Latin America and Asia in the context of International Scientific Cooperation and the Programme for Science and Technology for Development. The two latter programmes had absorbed between 85 and 95 million ECUs in the period 1987-1991.

35. He expressed satisfaction that the priorities suggested by the Committee had oriented the work of the Advisory Service on Transfer of Technology (ASTT). The main thrust of these activities should remain the furthering of technological capabilities of developing countries and, in particular, of human resources. The formation of expertise in developing countries in the areas of identification, evaluation and selection of imported technologies was very important. In view of the rapid evolution of developing countries' technical assistance requirements, the ASTT should report to the Committee on a regular basis. Similarly, the monitoring of certain of the secretariat's technical assistance activities should be systematized.

36. The representative of Gabon said that the necessity for technology transfer to developing countries arose from the economic realities in the third world, and notably in Sub-Saharan Africa. These were generally the outcome of two kinds of economic activities, namely activities without local transformation such as mining, forestry and agriculture, and commercial activities involving mainly imported goods. The first kind of activity was still carried out mostly by foreign firms operating in the host countries. These firms employed rapidly evolving technologies, but the transfer of know-how achieved through training and employment of local labour, in the long term, had sizeable positive, economic and social spill-over effects. However, some of the activities now integrated in the large firms could be subcontracted to local small- and medium-sized enterprises. The second activity, the commercialization of imported goods, was economically less beneficial because of its low value added, low technology-creation and low labour-absorptive capacity. In Africa, the intermediary level of small and medium-sized enterprises was still underdeveloped, despite its importance for balanced economic and social progress.

37. Although state-of-the-art technologies were necessary, he questioned whether the community adopting them could absorb them financially and intellectually. In his view, there was a need to place more emphasis on the transfer of elementary technologies with applications in agriculture, forestry, fisheries, etc. In Gabon and other developing countries, these technologies would have a much greater effect, reaching a larger part of the population and enhancing existing comparative advantages. Therefore, he hoped that the forthcoming discussions would deal mainly with the need for technological cooperation favouring the build-up of an elementary and accessible technological base. In this regard, a uniform approach to technology transfer would be inappropriate in view of the diverse national environments.

## Chapter III

## TRADE AND DEVELOPMENT OPPORTUNITIES AND IMPLICATIONS OF NEW AND EMERGING TECHNOLOGIES: THE CASE OF BIOTECHNOLOGY

(agenda item 4)

38. For its consideration of this item, the Committee had before it a report by the UNCTAD secretariat entitled "Trade and development opportunities and implications of new and emerging technologies: the case of biotechnology" (TD/B/C.6/154).

39. The Officer-in-Charge of the Technology Programme explained that, in order to assess the potential impact of agricultural biotechnology on trade in developing countries, the secretariat had examined the so-called "privatization" of biotechnology research in developed countries, the relevance of that research to developing countries' problems, and the status of research in and for developing countries. The analysis (TD/B/C.6/154) showed that the potential value of crops exported by developing countries for which commercializable results of plant and tissue culture could be expected in the next five years was of the order of $US 20 billion. However, the actual as compared to the potential impact on developing countries' agricultural trade depended not only on technical factors but also on the complex interaction of economic and institutional factors. These included: (a) the increasing trend towards secrecy in agricultural research associated with the growing relative importance of private rather than publicly funded R & D; (b) the tendency of even universities and public institutions to link themselves with the private sector; (c) the drive to extend the scope of intellectual property rights protection of biotechnology through the reform of industrial patent and/or plant breeders' rights legislation; and (d) the ability of most developing countries to optimize the size and quality of their investment in adaptive R & D, given that advances in agriculture were not readily transplantable from one locale to another without considerable investment in adaptation.

40. In conclusion, he said that international cooperation could help the developing countries to seize the opportunities offered by biotechnology by adopting certain measures, such as the establishment of research and training priorities in biotechnology; the exploration of channels and mechanisms for the transfer of useful biotechnologies from private enterprises in industrialized countries to developing countries; an enhanced role in agricultural biotechnology for the International Agricultural Research Centres, with special attention being paid to crops that were important to developing countries, but not grown in developed countries. Finally, intellectual property rights protection of biotechnology application raised a number of complex issues that needed to be further explored before the adoption of uniform international standards of protection.

41. The spokesman for the Group of 77 (Yugoslavia) stated that through biotechnology mankind had the capability to create and commercialize new products, thus altering the human equation itself, and affecting trade and development patterns globally. It was this revolution that the Committee was

entrusted with analysing - seeking insights into what was at stake for developing countries, then making recommendations which would help them to benefit from the "genie" that was biotechnology.

42. Referring to the "gene revolution", he said that it was expected to affect 90 per cent of the world's arable land and 45 per cent of its population as against the "green revolution" which had affected 40 per cent of the arable land and 25 per cent of the world's population. It meant a quantum leap in product development and marketability. Like the green revolution, it had given rise to the development of encapsulated embryos which could not be mass produced at the farmer's level yet had several applications in agriculture. There was little doubt that the short-, medium- and long-term impact on developing countries' trade and development would be considerable. For plants, the short-term impact would be slight but the medium-range effect would be great. Biotechnology had the potential to displace or eliminate traditional botanical exports of developing countries and to transfer production to laboratories and factories in the developed world.

43. Biotechnology was rapidly transforming the food-processing industry. Historically, the processors of agricultural products purchased them from commodity markets. Now proprietary products would be created out of commodities. Industry in the developed countries would use biotechnology to replace raw materials, reduce waste, create new products, eliminate supply instabilities and improve quality. This would affect not only food processing in developing countries but also their exports of agricultural commodities. Food security and self-sufficiency would change since the gene revolution would increase the dependence of developing-country farmers on external high-cost inputs, bearing hardest on those countries that were most dependent on commodities and agriculture. Animal genetics and bioprocessing in the dairy industry had equally far-reaching implications. If excluded, developing countries could lose dairy industry and trade prospects. For human health, the new bio-sciences promised "a medical revolution". The extent to which developing countries would have access to biopharmaceutical products in terms of technology, production and use would have an impact on their social infrastructure and well-being. Their ability to develop, obtain and control the new biotechnologies would determine the impacts on their trade and development.

44. Unlike the green revolution, with the gene revolution biotechnological development and commercialization had been concentrated in a few multinational companies of developed countries. While the former revolution had been driven by the public sector, the gene revolution was being propelled by the private sector. The profit motive, monopolistic processes, and secrecy could prevent the beneficial dissemination of discoveries to developing countries. This point had been made in the secretariat report (TD/B/C.6/154, para. (iii)). The trend towards "comprehensive coverage" of R & D in biotechnology by intellectual property rights protection was a logical corollary of market concentration and oligopolistic structures and practices. Proprietary rights over living material raised ethical and legal questions. The Group of 77 believed that attempts to seek patent protection for the new biotechnologies would erode the hitherto accepted principle that living matter and natural processes could not be patented. Many plant varieties used as sources for genetic research had been found in developing countries. There was little

justification for laboratory-created products of biotechnology being the subject of property rights while the raw materials of the process which were the fruit of the labour of generations of farmers could be gathered freely and without compensation. A strong case could be made for recognition of the farmers' rights as against the so-called plant breeders' rights and patents. Bio-diversity would depend on maintaining wild plants and local varieties. One of the goals of international cooperation in this area should be to create legal mechanisms and procedures to put this idea into practice. Much of the research in developed countries would need the mediation of local R & D laboratories in developing countries before it could be applied in developing countries but few of the latter countries possessed the means to work at the frontier of biotechnological innovation. Thus help from developed country Governments and enterprises was needed.

45. The Group of 77 agreed that the major challenge facing developing-country Governments and the international community would be how to devise channels for the transfer to developing countries of useful biotechnologies from private enterprises in developed market economies. New funding schemes should be created. International Agricultural Research Centres (IARCs) should, as part of their work on biotechnology, assist developing countries to negotiate transfers of technology with private enterprises. Publicly funded, regional and international institutions in this area should be established or strengthened for greater cooperation between developed and developing countries. Some institutions such as IARCs, which had had difficulty obtaining genetic-related material owing to protectionism, should take out patents and find the best way of transferring biotechnology to developing countries.

46. The gene revolution called for a public policy that was humanitarian and disseminative. Ecologically disastrous programmes associated with it should be eliminated. The perceived need expressed in several forums for a second green revolution to attack poverty and eradicate hunger in developing countries made it imperative that, before any agreement was reached on uniform international standards of protection of living material, ways should be found to stimulate invention and to promote both the transfer of biotechnology to developing countries and the attendant cooperation.

47. The representative of China said that since most developing countries relied on agriculture, biotechnology could make an enormous contribution to their economic growth. However, as developing countries lagged behind developed countries in biotechnology research owing to financial constraints and other reasons, it was understandable that developing countries would request biotechnology transfer from developed countries so as to be able to develop their agriculture and economies. This was in line with the need to take into account developing countries' requirements and special conditions. According to the Paris Convention for the Protection of Industrial Property, biotechnology was not subject to mandatory patent protection, so that countries could decide whether or not to have such protection. China had adopted legislation protecting the processes involved in the production of food, chemicals and medical products, and was now considering the extension of protection to the products themselves. However, in view of their special

situation, developing countries in general should be granted differential and preferential treatment in terms of intellectual property rights in biotechnology.

48. The spokeswoman for Group B (Netherlands) said that biotechnology and the question of its transfer to developing countries were complex issues that had been admirably anlysed in the secretariat report (TD/B/C.6/154). She reiterated that Group B was in favour of transfer of technology, and particularly supported biotechnology transfer to developing countries. Regarding the modalities, she said that Group B believed that the protection of intellectual property rights might be beneficial although not sufficient for building up biotechnological capabilities and competence for socio-economic development. She pointed out that a great number of Group B countries were providing technical assistance to developing countries for the build-up of their biotechnological infrastructure. In the field of intellectual property rights protection, several international activities had been initiated such as the review of breeders' rights in the context of the International Union of the Protection of New Varieties of Plants (UPOV). Although the secretariat report could not have taken into account the results of a recent conference on this subject, thought might have been given to the possibilities of setting up breeders' rights systems in developing countries. Farmers' rights had been given considerable attention in FAO in the context of conservation of biodiversity, but as this did not primarily involve biotechnology it could hardly be considered part of the core business of the Committee on Transfer of Technology.

49. While the secretariat report placed just emphasis on the importance of adaptive research and development and offered some considerations thereon, it did not present concrete new ideas for either national or international policy actions. Furthermore, no mention had been made of existing but neglected possibilities to exploit available knowledge. It would also have been useful to have had information on the activities of other international organizations, notably those in the United Nations system. The report correctly stated that only a tiny fraction of international trade in agricultural products was currently affected by biotechnnology, let alone by patents thereon. Concerning the extension of secrecy and confidentiality through intellectual property rights protection discussed in the document, she said that this allegation was not correct. On the contrary, protection of intellectual property rights resulted in relevant information being published and thus becoming readily available. She also noted that intellectual property rights protection would not prohibit the use of engineered material for further research, since the so-called research exemption meant that protected material could be used by everyone. In conclusion, Group B considered that the report served as a basis for reflection and discussion on developments taking place in the realm of biotechnology and on possible policy implications. However, her Group had found that, at this stage, it was an insufficient basis for reaching policy conclusions in this field.

## Chapter IV

## REVIEW OF THE WORK PROGRAMME OF THE COMMITTEE

(agenda item 5)

50. For its consideration of this agenda item, the Committee had before it the following documents:

"Review of the work programme of the Committee, implementation of decisions relating thereto and proposals for further work", report by the UNCTAD secretariat (TD/B/C.6/155); and

"Activities of the Advisory Service on Transfer of Technology", report by the UNCTAD secretariat (TD/B/C.6/155/Add.1).

51. The Officer-in-Charge of the Technology Programme, introducing agenda item 5, described the work undertaken by the secretariat since the seventh session of the Committee. Work had continued on issues related to trade and development arising from technological change, including advances in such new technologies as electronics and biotechnology. A review had been made of recent trends in international technology flows, including the factors affecting them and their policy implications, as well as technology indicators in wide use, including their applicability to developing countries. The analysis of international legal aspects of the transfer and development of technology was continuing and a number of country case studies had been completed. Work was under way on industrial property issues as well as on policies and instruments for the promotion of technological innovation. The linkage and feedback between the secretariat's research functions and its technical assistance activities ensured optimal use of the limited resources available to the secretariat and helped in achieving overall consistency among the different activities. In this sense, the activities of the Advisory Service on Transfer of Technology (ASTT), in organizing human resource development programmes and providing technical assistance, were aimed at improving the efficiency of institutions and the quality of decision-making in the area of transfer of technology and technological development. During the reporting period and up to March 1991, ASTT training programmes had reached approximately 200 participants.

52. The spokesman for the Group of 77 (Egypt) said that there was a need to examine international transfer of technology in terms of the impacts of integration schemes among the developed countries, the outcome of the Uruguay Round of multilateral trade negotiations and the implications of changes in countries of Eastern Europe and in East/West economic relations. He suggested that UNCTAD study how international and regional financial institutions could provide further support, giving due consideration in structural adjustment programmes to the development of national technological capabilities of developing countries. UNCTAD could propose ways of strengthening not only R & D activities in developing countries but also R & D cooperation between developed and developing countries. The modalities of cooperation among consultancy and engineering design enterprises could also be examined. The implications of new and emerging technologies, particularly microelectronics, for the trade and development prospects of developing countries should likewise be studied. Future discussions in the Committee should highlight

the interrelationships among technology, services, investment, financing and trade, and their implications for the technological transformation of developing countries. Work on international legal instruments related to transfer of technology should continue, particularly on the draft code of conduct on transfer of technology, on industrial property and case studies on national laws and regulations on the subject. He also suggested that the Committee investigate ways and means of promoting the transfer of environmentally sound technologies to the developing countries on concessional and non-commercial terms. To this end UNCTAD could help in developing indigenous environmentally sound technology, ensuring that environmental concerns did not constitute an impediment to the transfer of advanced technology to developing countries.

53. He urged the Committee to take action to reconvene the Governmental Experts on Reverse Transfer of Technology and drew attention to the fact that there was no formal decision by the Committee to dismantle this Group of Experts. The Committee should also launch an appeal for reviving the Inter-Agency Group on Reverse Transfer of Technology. Since South/South cooperation was considered to be an aspect of the international development strategy of the 1990s, regional and interregional cooperation projects should be formulated on the subject. With regard to the factors affecting technological innovation in developing countries, UNCTAD should continue to study them and to examine the role of entrepreneurial capabilities in the transfer, development and financing of technology.

54. The Group of 77 valued highly the technical assistance activities undertaken by ASTT. Developing countries which lacked a basic technology-related infrastructure were in particular need of technical assistance. The UNCTAD secretariat should continue to provide support and advice in response to requests, including the organization of seminars. Hence the Group was appealing to donor countries to increase their financial contributions to the UNCTAD technical assistance programme.

55. The representative of China commended the technical assistance and advisory services provided by the secretariat and its Advisory Service on Transfer of Technology (ASTT), which included workshops and seminars. New and emerging technologies offered the developing countries increased opportunities. The secretariat should study further the question of technological change and the protection of new and emerging technology which affected developing countries' trade and influenced technology flows. ASTT should continue its activities designed to strengthen human resource capabilities, giving priority to the development dimension as well as to assisting and improving R & D activities. In this context, national, regional, and interregional possibilities should be examined. Developing countries should also continue their endeavours to promote their own technological development and improve their mastery of technology, especially new technology. The Committee should explore ways to strengthen the roles of regional and interregional financial institutions. An early conclusion of the negotiations on an international code of conduct on technology transfer was important as this would serve the legitimate interests of both suppliers and recipients of technology and thus contribute to the revitalization of international technological flows.

56. The spokesman for Group B (Netherlands) welcomed the orientation of work in the areas of new and emerging technologies, established at the seventh session of the Committee. Group B favoured giving attention in future to advanced materials and their real and potential impact on the exports of resource-producing countries. The concrete subjects for the next session of the Committee should be chosen in terms of their relevance to national policy-making in developing countries. Small and medium-sized enterprises, innovation and the role of entrepreneurs played a vital role as key factors in promoting the development and transfer of technology to developing countries. The secretariat had apparently overlooked this aspect in its report. Project definition, execution and evaluation could be further improved. All countries - developed and developing - should rely as far as possible on their own development resources and capacities. The UNCTAD secretariat should formulate concrete policy options to facilitate consideration of regional cooperation and of ways to improve the investment climate. In line with Committee resolution 32 (VII), paragraph 2, work on country studies should continue. An assessment should be made of the interaction between national technology policies and the promotion of innovation.

57. Group B would be interested to hear what was being done in the area of national laws and regulations conducive to technology transfer and development. The secretariat had been requested in paragraph 6 of resolution 32 (VII) to carry out comparative analyses concerning the role of different national legal systems in promoting investment, innovation and transfer of technology. Group B believed that adequate consideration should be given to identifying, developing and helping to disseminate those elements of national policy and domestic conditions necessary for innovation, investment and diffusion of technology nationally and in the global trading system. Identification of the challenges for the 1990s and analysis of contrasting national experiences warranted further consideration in the work programme, particularly in the run-up to UNCTAD VIII. The Group also appreciated the work that had been done in the field of technology in preparation for the Second United Nations Conference on Least Developed Countries held in Paris in 1990. The Group noted with satisfaction the priority attention given by ASTT to the development of human resources. This was a key activity which should be carried further. Cooperation should continue on the transfer of technology among developing countries as a channel for acquiring and exchanging technological experience. Noting that, for the Uruguay Round, the secretariat had published Technology, Trade Policy and the Uruguay Round, he asked that that document be circulated to the Committee members. Finally, Group B requested that future programmes of work focus on those areas where UNCTAD had particular expertise.

## Chapter V

## ACTION BY THE COMMITTEE

58. At the Committee's 84th meeting, on 26 April 1991, the spokesman for the Group of 77 (Mexico) introduced a draft resolution on agenda items 3, 4 and 5 submitted by Mexico on behalf of the States members of the Group of 77 (TD/B/C.6/L.103).

59. At the Committee's 86th (closing) meeting, on 30 April 1991, the Chairman introduced a draft resolution which he had submitted as a result of informal negotiations (TD/B/C.6/L.105).

60. At the same meeting the Committee adopted the draft resolution TD/B/C.6/L.105 (see annex, resolution 33 (VIII)). In consequence, the draft resolution in TD/B/C.6/L.103 was withdrawn by its sponsors.

## CLOSING STATEMENTS

61. The spokesman for the Group of 77 (Mexico) reiterated that transfer of technology was a main feature of society today and one which affected all aspects of socio-economic life. Technology was important because it gave mankind hope. So far, however, the distribution pattern of technology diffusion had not favoured the developing countries. The technological gap between the developed and the developing countries had been widening. The acquisition and advancement of technology were prerequisites to progress in developing countries because technology was the very engine driving development. While expressing satisfaction with the adoption by the Committee of resolution 33 (VIII), he said that the outcome was still not sufficient. He therefore called on the developed countries to continue supporting the efforts of developing countries to reduce the ever-widening technological gap between developed and developing countries.

62. The representative of China praised the cooperative manner in which all delegations had dealt with the issue of new and emerging technology flows between developed and developing countries and their impact on trade and development. Through intensive consultations characterized by a search for mutual understanding, the session had achieved a comprehensive and balanced outcome. While consensus had not been reached regarding the establishment of a group of experts, there were hopeful signs that discussions could now advance further and that the dialogue launched at the current session would serve as a good basis for future work.

63. The spokeswoman for Group B (Netherlands) also expressed satisfaction with the positive outcome of the session. Although the consultations on the draft code of conduct on the transfer of technology had been time-consuming, the Committee's agenda had been covered with remarkable efficiency.

64. The representative of the Union of Soviet Socialist Republics observed that the reports submitted by the secretariat were significant not only for the theories they expounded but also for their pragmatism. Indeed, the Committee's work was increasingly geared towards resolving practical problems. All delegations merited praise for their efforts to reach consensus.

65. The Deputy to the Secretary-General of UNCTAD said that in adopting resolution 33 (VIII), the Committee had once again proved its ability to take major initiatives by bringing to the forefront of international discussions the cross-sectoral and systemic issues that were critical to the trade and development prospects of all countries, and particularly the developing countries. The resolution recognized the relationship between technology, services, trade, investment and availability of financial resources. It would contribute significantly to the preparations under way for UNCTAD VIII. The suggestions which had been put forward during the session offered valuable guidance for future work, especially with respect to technical assistance activities, the Advisory Service on Transfer of Technology, and the identification of needs in respect of transfer and development of technology, technological innovation and cooperation, including that between enterprises at the regional and subregional levels.

## Chapter VI

## ORGANIZATIONAL MATTERS

### A. Opening of the session

66. The eighth session of the Committee on Transfer of Technology was opened on 22 April 1991 by Mr. Borislav VUKOVIC (Yugoslavia) in the absence of the Chairman of the Committee at its seventh session.

### B. Election of officers

(agenda item 1)

67. At its 81st (opening) meeting, on 22 April 1991, the Committee elected Mr. Juan Archibaldo LANUS (Argentina) as Chairman, Ms. Taous FEROUKHI (Algeria), Ms. Lakshmi PURI (India), Ms. Lourdes MOLINOS (Venezuela), Ms. Merethe NERGAARD (Norway) and Mr. Ivan SRONEK (Czechoslovakia) as Vice-Chairmen, and Mr. Jean-Louis TORDEUR (Belgium) as Rapporteur.

### C. Adoption of the agenda and organization of work

(agenda item 2)

68. Also at its 81st meeting, the Committee adopted the provisional agenda for its eighth session (TD/B/C.6/152), as follows:

1. Election of officers
2. Adoption of the agenda and organization of work
3. Transfer and development of technology in a changing world environment: the challenges of the 1990s
4. Trade and development opportunities and implications of new and emerging technologies: the case of biotechnology
5. Review of the work programme of the Committee
6. Provisional agenda for the ninth session of the Committee
7. Other business
8. Adoption of the report of the Committee to the Trade and Development Board.

69. At the same meeting the Committee agreed that, parallel to the Committee's meetings, informal negotiations would be held on 23 and 24 April 1991, for the further elaboration of the draft international code of conduct on the transfer of technology.

## D. Membership and attendance

70. The following States members of UNCTAD, members of the Committee were represented at the session: Algeria; Argentina; Australia; Austria; Bangladesh; Belgium; Bolivia; Brazil; Bulgaria; Cameroon; Canada; Chile; China; Colombia; Côte d'Ivoire; Cuba; Czechoslovakia; Democratic People's Republic of Korea; Denmark; Ecuador; Egypt; El Salvador; Ethiopia; Finland; France; Germany; Ghana; Greece; Hungary; India; Indonesia; Iraq; Ireland; Italy; Japan; Jordan; Kuwait; Liberia; Madagascar; Malaysia; Mexico; Morocco; Netherlands; Nicaragua; Nigeria; Norway; Pakistan; Philippines; Portugal; Qatar; Republic of Korea; Romania; Saudi Arabia; Senegal; Spain; Sri Lanka; Sudan; Sweden; Switzerland; Thailand; Tunisia; Turkey; Union of Soviet Socialist Republics; United Kingdom of Great Britain and Northern Ireland; United States of America; Venezuela; Viet Nam; Yemen; Yugoslavia; Zaire; Zimbabwe.

71. The following other States members of UNCTAD, not members of the Committee, were represented at the session: Afghanistan; Gabon; Holy See; Lebanon.

72. The United Nations Development Programme was represented at the session.

73. The following specialized and related agencies were represented at the session: International Labour Organisation; World Intellectual Property Organization; United Nations Industrial Development Organization. The General Agreement on Tariffs and Trade was also represented at the session.

74. The following intergovernmental organizations were represented at the session: European Economic Community; International Organization for Migration; Permanent Secretariat of the General Treaty on Central American Economic Integration.

75. The following non-governmental organizations were represented at the session: General Category: International Bar Association; International Chamber of Commerce; World Assembly of Small and Medium Enterprises; World Association of Former United Nations Interns and Fellows; World Confederation of Labour; World Federation of United Nations Associations.

## E. Provisional agenda for the ninth session of the Committee

(agenda item 6)

76. At its 86th plenary meeting, on 30 April 1991, the Committee decided to authorize the Secretary-General of UNCTAD to prepare a draft provisional agenda for its ninth session, for approval at consultations held pursuant to Trade and Development Board decision 143 (XVI).

## F. Other business

(agenda item 7)

77. At its 86th plenary meeting, on 30 April 1991, the Committee took note of the report of the Bureau on credentials (TD/B/C.6/156).

## G. Adoption of the report of the Committee to the Trade and Development Board

(agenda item 8)

78. At its 86th (closing) meeting, on 30 April 1991, the Committee adopted the draft report on its eighth session (TD/B/C.6/L.104 and Add.1-3) and authorized the Rapporteur to complete the final version as appropriate.

ANNEX I

RESOLUTION ADOPTED BY THE COMMITTEE ON TRANSFER OF TECHNOLOGY AT ITS EIGHTH SESSION

33 (VIII). Transfer and development of technology

The Committee on Transfer of Technology,

Recalling the relevant decisions and resolutions of the United Nations Conference on Trade and Development, Board resolution 380 (XXXVI) and Board decision 384 (XXXVII), and resolutions 31 (VI) and 32 (VII) of the Committee on Transfer of Technology,

Noting with interest the useful studies and documents submitted to it for consideration at its eighth session (see documents TD/B/C.6/153, 154, 155 and Add.1),

1. Recognizes that the promotion of transfer and development of technology to developing countries needs an open and supportive international economic and policy environment and strengthened international cooperation to enable them to cope with, and benefit from, the challenges and opportunities of technological advances; and further recognizes that technological dynamism and capacity-building requires a supportive national policy environment in developing countries;

2. Calls upon Governments to adopt measures, including intellectual property rights protection and technical cooperation, to increase technology flows to developing countries and facilitate their access to technology, in particular those new and advanced technologies of critical importance for their development, with a view to reducing the existing technological gap between developed and developing countries; recognizes that in this regard States, as an aspect of national sovereignty, will take into account their public interest and development objectives and further recognizes that export restrictions can impede technology flow;

3. Recommends to Governments to continue, wherever feasible, the intensification or the establishment of cooperation arrangements between developed and developing countries on research and development in agreed areas, through, inter alia, innovation centres, laboratories in developing countries, training of personnel and joint research in laboratories in developed countries, taking into account development priorities;

4. Calls for the establishment of collaborative arrangements for research and development (R & D) and innovation between firms in different countries, in particular of developed and developing countries, in specific technological sectors and areas and, to this end, recommends that enterprises should be encouraged by developed and developing countries to invest in, and undertake, R & D activities in developing countries, assist developing countries' enterprises in adapting new technologies and develop other forms of cooperation. In this context, incentives should be provided to the

enterprises to undertake such activities in developing countries and to enter into collaborative arrangements, or to associate developing country enterprises with existing arrangements;

5. Recommends that development partners support developing countries in their efforts to acquire, create and develop the skill and knowledge-base necessary for the development of environmentally sound technologies;

6. Notes the trade and development implications and opportunities that biotechnology has for developing countries; further takes note of the recommendations contained in document TD/B/C.6/154 and requests Governments to explore ways and means of involving developing countries in R & D activities in this field, including the adoption of specific measures to facilitate the transfer of biotechnologies to developing countries;

7. Invites Governments to increase their technical cooperation to developing countries, and especially to least developed countries, through various modalities responding to their evolving needs and requirements in the field of transfer and development of technology and recommends that appropriate support be provided for technological infrastructure and capacity-building and human-resource development, including the training of skilled personnel in enterprises, operating plants and R & D institutions in developed countries, as well as support for South-South technical cooperation facilities;

8. Recommends to Governments that they consider providing increased support to existing international programmes, such as the United Nations Development Programme's TOKTEN (transfer of knowledge through expatriate nationals) and the International Organization for Migration relevant programme, in order to allow a larger number of developing countries to benefit from knowledge and expertise accumulated by their skilled personnel residing abroad; and requests the UNCTAD secretariat to inform the Committee at its ninth session on developments in both national policies and international cooperation bearing on the question of reverse transfer of technology;

9. Requests the UNCTAD secretariat, taking into account the results of UNCTAD VIII, to prepare a comprehensive study, within existing and voluntarily contributed resources, on the interrelationships among technology, trade, services, availability of financial resources and investment at the global level, particularly insofar as the trade and development prospects of developing countries are concerned. In that respect, that study should take into account all major developments in the world economy having implications for the transfer of technology to developing countries;

10. Invites the UNCTAD secretariat to study and propose means for strengthening cooperation in the field of R & D activities among countries, particularly between developed and developing countries, including among enterprises, within existing and voluntarily contributed resources and in cooperation with the United Nations Centre for Science and Technology for Development, taking into account similar work undertaken by other international organizations;

11. Further invites the UNCTAD secretariat to study the implications and opportunities of new and advanced technologies in the case of micro-electronics and new materials for the trade and development prospects of developing countries;

12. Notes with appreciation the activities of the Advisory Service on Transfer of Technology (ASTT) and recommends that the ASTT, in responding to the changing needs of developing countries for technical assistance: give priority to human resource development; identify developing countries' needs and requirements in the area of transfer and development of technology and technological innovation, including new and advanced technologies; and assist these countries, particularly the least developed ones, in establishing and strengthening their capacity for evaluation, selection and acquisition of technology, as well as in exploring possibilities for technological cooperation, including between enterprises at the regional and interregional levels, in cooperation with other United Nations bodies working in similar areas, within existing and voluntarily contributed resources. To this end, the Committee requests the Secretary-General of UNCTAD to prepare a report on the work of the Advisory Service on Transfer of Technology, covering the ongoing technical assistance in the area of technology, to be presented to the Committee at its ninth session.

## ANNEX II

## CHECKLIST OF DOCUMENTS

| Symbol | Title | Agenda item |
|---|---|---|
| TD/B/C.6/152 | Provisional agenda, annotations to the provisional agenda and suggestions for the organization of work<br>Note by the UNCTAD secretariat | 2 |
| TD/B/C.6/153 and Corr.1 (English only) | Transfer and development of technology in a changing world environment: the challenges of the 1990s<br>Report by the UNCTAD secretariat | 3 |
| TD/B/C.6/154 | Trade and development opportunities and implications of new and emerging technologies: the case of biotechnology<br>Report by the UNCTAD secretariat | 4 |
| TD/B/C.6/155 | Review of the work programme of the Committee, implementation of decisions relating thereto and proposals for further work<br>Report by the UNCTAD secretariat | 5 |
| TD/B/C.6/155/Add.1 | Activities of the Advisory Service on Transfer of Technology<br>Note by the UNCTAD secretariat | 5 |
| TD/B/C.6/156 | Report of the Bureau on credentials | 7 |
| TD/B/C.6(VIII)/Misc.1 | Index of resolutions, decisions, agreed conclusions and recommendations adopted by the Committee on Transfer of Technology<br>Note by the UNCTAD secretariat | |
| TD/B/C.6/INF.16 | List of participants | |
| | BACKGROUND DOCUMENTS | |
| TD/B/1203-<br>TD/B/C.6/151 | Report of the Committee on Transfer of Technology on its seventh session | |
| TD/B/C.6/INF.2/Rev.7 | Bibliography of documents on transfer and development of technology - Documents prepared by or in cooperation with the UNCTAD secretariat | |

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|---|---|
| UNCTAD/ITP/TEC/4 | Transfer and development of technology in developing countries: a compendium of policy issues |
| UNCTAD/ITP/TEC/6 and Corr.1 | The implementation of laws and regulations on transfer of technology: the experience of the Republic of Korea |
| UNCTAD/ITP/TEC/10 | The diffusion of electronics technologies in the capital goods sector in some developing countries |
| UNCTAD/ITP/TEC/11 | Research and development institutes in developing countries and their contribution to technological innovation |
| UNCTAD/ITP/TEC/12 | Transfer and development of technology in the least developed countries: an assessment of major policy issues |
| UNCTAD/ITP/TEC/13 | The use of patents for the protection of technological innovation: A case study of selected Swedish firms |
| UNCTAD/ITP/TEC/14 | Tecnología, comercio y desarrollo en América Latina en los 90 |
| UNCTAD/ITP/TEC/15 | The implementation of laws and regulations on transfer of technology: The experience of Brazil |
| UNCTAD/ITP/TEC/17 | Industrial property protection and technological innovation: A case study of the United Republic of Tanzania |
| UNCTAD/ITP/TEC/18 | Historical trends in protection of technology in developed countries and their relevance for developing countries |
| UNCTAD/ITP/TEC/19 | Technology indicators and developing countries |
| TD/CODE TOT/55 | The relevance of recent developments in the area of technology to the negotiations on the draft international code of conduct on the transfer of technology |
| TD/CODE TOT/56 | Further consultations on a draft international code of conduct on the transfer of technology |

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